

USFS PRIEST LAKE RANGER STATION (PWS #1090165) SOURCE WATER ASSESSMENT REPORT

September 16, 2002



State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for USFS Priest Lake Ranger Station (PWS #1090165)*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The USFS Priest Lake Ranger Station drinking water system consists of two wells. The wells are located on the ranger station compound along Highway 57, west of Priest Lake's Kalispell Bay. The system is not experiencing water quality issues at this time. Water is supplied by Well #1, with Well #2 being used for backup. The wells draw from the same well field and are located only 15' from each other. They sample monthly for total coliform bacteria. The most recent positive sample was collected 7/29/02. The water system has not experienced contamination of any other kind above maximum contaminant levels.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

USFS Priest Lake Ranger Station should focus drinking water protection activities on implementation of practices aimed at maintaining the current quality of their drinking water. This includes enacting a drinking water protection plan that ensures best management practices at the airstrip located across the highway from the ranger station. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. For assistance in developing protection strategies, please contact your regional Idaho Department of Environmental Quality office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR USFS PRIEST LAKE SOURCE WATER ASSESSMENT FOR PRIEST LAKE RANGER STATION

Section 1. Introduction- Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

USFS Priest Lake Ranger Station serves approximately 90 people during the summer months and approximately 50 people during the winter months. It is located along Highway 57, west of Priest Lake's Kalispell Bay (Figure 1). The public drinking water system for USFS Priest Lake Ranger Station is comprised of two wells.

USFS Priest Lake Ranger Station is currently not facing water quality issues. The wells are sampled monthly for total coliform bacteria. Positive samples are infrequent. The last positive sample was collected 7/29/02. Nitrate is monitored annually and nitrite is monitored every nine years. Both are well below the maximum contaminant level of 10.0mg/L.

Inorganic contaminants, including lead and copper, are monitored every three years. Lead and copper levels within the water system are below action levels. Other inorganic chemicals detected in water samples include barium which was detected at .02mg/L on 4/28/99, and fluoride which was detected at .12mg/L on 3/24/83 and at .2mg/L on 4/28/99. The maximum contaminant level for barium is 2.0mg/L, and the maximum contaminant level for fluoride is 4mg/L.

The water system monitors radionuclides every four years. These have been found to be within normal limits.

No volatile organic chemicals or synthetic organic chemicals have been detected in water samples. The system has obtained a waiver for the monitoring of volatile organic chemicals and a partial waiver for the monitoring of synthetic organic chemicals.

Defining the Zones of Contribution- Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the three-year (Zone 1B), six-year (Zone 2), and ten-year (Zone 3) times-of-travel (TOT) for water in the vicinity of Priest Lake, Idaho. The computer model used site specific data, assimilated by DEQ from a variety of sources including local well logs. The delineated source water assessment areas for USFS Priest Lake Ranger Station can best be described as long, narrow capture zone that extends towards the well heads from the southwest. The actual data used by DEQ in determining the source water assessment delineation area are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation area were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use in the area surrounding the USFS Priest Lake Ranger Station drinking water system is forest.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during the spring of 2002. The first phase involved identifying and documenting potential contaminant sources within the USFS Priest Lake Ranger Station source water assessment area through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Jim Grubb.

There is one documented potential contaminant sites within the delineated source water area. The site is an airstrip, where there is the potential for a fuel spill. Table 1 lists the potential contaminants of concern, time of travel zones, and information source.

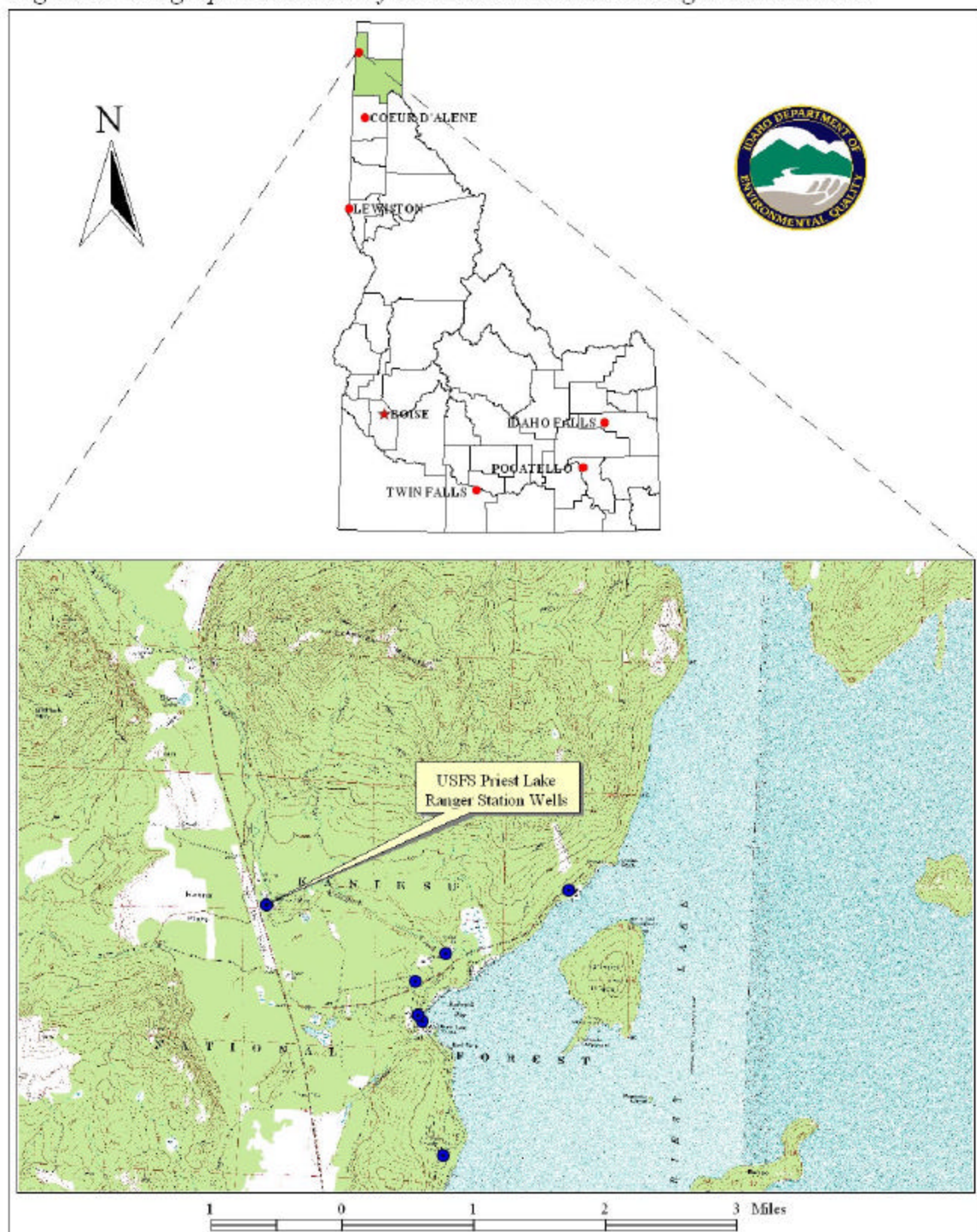
Table 1. USFS Priest Lake Ranger Station Potential Contaminant Inventory

SITE #	Source Description	TOT Zone ¹ (years)	Source of Information	Potential Contaminants ²
1	Air Strip	3	Database Search	VOC, SOC

¹TOT = time of travel (in years) for a potential contaminant to reach the wellhead

² IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 1. Geographic Location of the USFS Priest Lake Ranger Station Wells



[illegible]

Section 3. Susceptibility Analysis

The susceptibility of the source to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Wells #1 and #2

The wells' hydrologic sensitivity is high. This reflects porous nature of the soils in the area and the lack of significant confining layers retarding the vertical transport of contaminants.

Well Construction

Well construction directly affects the ability of the wells to protect the aquifer from contaminants. Lower scores imply a system that can better protect the water. The USFS Priest Lake Ranger Station drinking water system consists of two wells that extract ground water for domestic use. Water extraction is monitored and managed by the system operator.

Well #1

Well 1's system construction score is moderate. The well was drilled in 1963 and is 96' deep. The well casing extends to the bottom of the well and is 8" in diameter and .280" thick. The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all public water systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Various aspects of the standards can be assessed from well logs. Table 1 of the *Recommended Standards for Water Works (1997)* states that 8-inch steel casing requires a thickness of 0.322 inches. While the well may have met standards at the time it was drilled, it does not meet today's construction standards. The casing was perforated from 84' to 94'. The wellhead has been properly maintained and is located outside of the 100-year floodplain.

Well #2

Like Well 1, Well 2 received a moderate system construction score. Well 2 was drilled in 1980. The well is 96' deep and screened from 86' to 96'. The well's casing is 6" in diameter. The thickness of the casing is unknown. A puddling clay surface seal was installed to 25'. The wellhead and sanitary seals are intact and the well is located outside of the 100-year floodplain.

Potential Contaminant Source and Land Use

Wells #1 and #2

The wells rated in the low category for all chemical classes. There is one documented potential contaminant site located within the wells' source water assessment areas.

Final Susceptibility Ranking

In terms of the total susceptibility score, it can be seen from Table 2 that the wells showed moderate overall susceptibility to all types of chemical contaminants.

Table 2. Summary of USFS Priest Lake Ranger Station Susceptibility Evaluation

Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	H	L	L	L	L	M	M	M	M	M
2	H	L	L	L	L	M	M	M	M	M

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

The USFS Priest Lake Ranger Station drinking water system is currently not threatened by significant potential sources of contamination.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. USFS Priest Lake Ranger Station should focus source water protection activities on implementation of practices aimed at maintaining the quality of their drinking water. The water system should develop a drinking water protection plan that includes public education, potential contaminant site management measures and contingency components. Public participation might take the form of household hazardous waste collection days and should inform residents and employees of the location of their wells and the location of the wells' source water assessment areas. The protection plan should outline best management practices in regard to fuel usage and storage for the airstrip located within the wells' source water assessment areas. Lastly, the water system should develop a contingency plan that lists the steps to be taken in the event of a drinking water emergency. The contingency plan should identify an alternative source of drinking water should the current wells ever become permanently contaminated. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Assistance

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional IDEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, Idaho Rural Water Association, at 1-800-962-3257 for assistance with drinking water protection (formerly wellhead protection) strategies.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Attachment A

USFS Priest Lake Ranger Station Susceptibility Analysis Worksheets

Ground Water Susceptibility Report

Public Water System Name : USFS PRIEST LAKE RANGER STATION

Well# : WELL #1

Public Water System Number : 1090165

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1. System Construction		SCORE			
	Drill Date	1/24/1963			
	Driller Log Available	YES			
Sanitary Survey (if yes, indicate date of last survey)		YES	1999		
Well meets IDWR construction standards		NO	1		
Wellhead and surface seal maintained		YES	0		
Casing and annular seal extend to low permeability unit		NO	2		
Highest production 100 feet below static water level		NO	1		
Well located outside the 100 year flood plain		YES	0		
Total System Construction Score			4		
2. Hydrologic Sensitivity					
	Soils are poorly to moderately drained	NO	2		
Vadose zone composed of gravel, fractured rock or unknown		YES	1		
Depth to first water > 100 feet		NO	1		
Aquitard present with > 50 feet cumulative thickness		NO	2		
Total Hydrologic Score			6		
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score
					Microbial Score
	Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0
	Farm chemical use high	NO	0	0	0
IOC, VOC, SOC, or Microbial sources in Zone 1A		NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A			0	0	0
Potential Contaminant / Land Use - ZONE 1B					
	Contaminant sources present (Number of Sources)	NO	0	0	0
	(Score = # Sources X 2) 8 Points Maximum		0	0	0
Sources of Class II or III leachable contaminants or		NO	0	0	0
4 Points Maximum			0	0	0
Zone 1B contains or intercepts a Group 1 Area		NO	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land		0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B			0	0	0
Potential Contaminant / Land Use - ZONE II					
	Contaminant Sources Present	YES	0	2	2
Sources of Class II or III leachable contaminants or		YES	0	1	1
Land Use Zone II	Less than 25% Agricultural Land		0	0	0
Potential Contaminant Source / Land Use Score - Zone II			0	3	3
Potential Contaminant / Land Use - ZONE III					
	Contaminant Source Present	NO	0	0	0
Sources of Class II or III leachable contaminants or		NO	0	0	0
Is there irrigated agricultural lands that occupy > 50% of		NO	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone III			0	0	0
Cumulative Potential Contaminant / Land Use Score			0	3	3
4. Final Susceptibility Source Score			10	11	11
5. Final Well Ranking			Moderate	Moderate	Moderate

Ground Water Susceptibility Report

Public Water System Name : USFS REEDER BAY & LEDGEWOOD

Well# : WELL

Public Water System Number 1090161

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1. System Construction		SCORE			
	Drill Date	7/7/1972			
	Driller Log Available	YES			
	Sanitary Survey (if yes, indicate date of last survey)	YES	1999		
	Well meets IDWR construction standards	YES	0		
	Wellhead and surface seal maintained	YES	0		
	Casing and annular seal extend to low permeability unit	NO	2		
	Highest production 100 feet below static water level	NO	1		
	Well located outside the 100 year flood plain	YES	0		
Total System Construction Score			3		
2. Hydrologic Sensitivity					
	Soils are poorly to moderately drained	YES	0		
	Vadose zone composed of gravel, fractured rock or unknown	YES	1		
	Depth to first water > 300 feet	NO	1		
	Aquitard present with > 50 feet cumulative thickness	NO	2		
Total Hydrologic Score			4		
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score
	Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0
	Farm chemical use high	NO	0	0	0
	IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A			0	0	0
Potential Contaminant / Land Use - ZONE 1B					
	Contaminant sources present (Number of Sources)	YES	1	0	0
	(Score = # Sources X 2) 8 Points Maximum		2	0	0
	Sources of Class II or III leachable contaminants or	YES	1	0	0
	4 Points Maximum		1	0	0
	Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0
	Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B			3	0	0
Cumulative Potential Contaminant / Land Use Score			3	0	0
4. Final Susceptibility Source Score			8	7	7
5. Final Well Ranking			Moderate	Moderate	Moderate

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score =
Hydrologic Sensitivity + System
Construction + (Potential
Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic
Sensitivity + System Construction +
(Potential Contaminant/Land Use x
0.35)

Final Susceptibility Scoring:

0-5 = Low Susceptibility

6-12 = Moderate Susceptibility

> 13 = High Susceptibility

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.